Using LaTex and BibTex to Write Academic Documents

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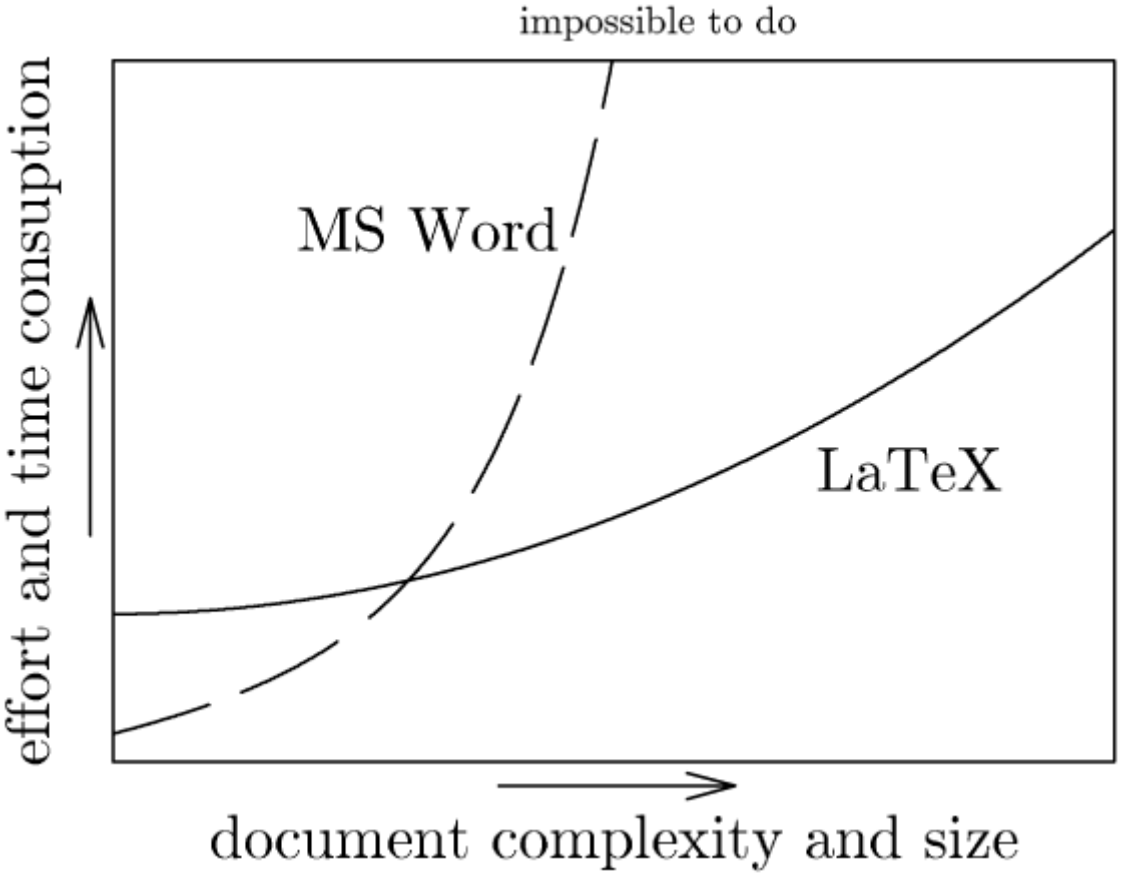
Introduction

- In LaTex, a markup language is used to describe document structure and format, and get the source file.
- LaTex can process the source file and generate the viewable document (e.g. pdf file).
- The difference from Microsoft Word: in Word, what you see is what you get.

Comparison between MS Word and LaTex



The First Example

```
% hello.tex - Our first LaTeX example!

\documentclass{article}

\begin{document}

Hello World!

\end{document}
```

Notes:

- A comment starts with “%”
- General format of a latex command:

\command_name[arguments]{arguments}

  - arguments in square brackets are optional, whereas curly braces are compulsory.

Process LaTex Source files Under Linux

- Save it as *hello.tex*
- At the command prompt,
  - To compile the source file, type the command:
    latex hello
  - *hello.dvi* file will be generated
  - To view *dvi* file, type the command:
    xdvi hello
  - To convert *dvi* file to *ps* file: type the command:
    dvips hello.dvi –o hello.ps
  - To convert dvi file to pdf file: type the command:
    dvipdf hello.dvi hello.pdf

Process LaTex Documents Under Windows

- Install *MikTex*
  - MikTex is an implementation of TeX and related programs for Windows
  - Downloading address: http://miktex.org/About.aspx
- Install *WinEdt*
  - File editor: having *syntax highlighting*, that is, the LaTeX commands are shown differently than the rest of the text (e.g. different colour)
  - Integrating functionalities to process LaTex documents
  - Downloading address: http://www.winedt.com/

Title, Author, Abstract and Section,

- \title{*title text*}
- \author{*author list*}
- \date{*date*}
- \maketitle
- \begin{abstract}
  …
  \end{abstract}
- \section{*section title*}
- \subsection{*subsection title*}

Mathematics

- Typesetting mathematics is one of Latex's greatest strengths.
- There are two modes for presenting the mathematic formulae
  - Text: formulae are displayed within the body of the main text
  - Displayed: the formulae are separate from the main text

Mathematics

- Text mode: $ … $
- Displayed mode:

```
\begin{equation}
   …
\end{equation}
```

Cross references

- There are often cross references to a certain segment of the text.
- LaTex provides the following commands for cross referencing
  - \label{identifier}
  - \ref{identifier}, \pageref{identifier}

Bibtex and Bibliography

- A Bibtex database is stored as a *.bib* file. It is a plain text file, and so can be viewed and edited easily. An example of a Bibtex entry (corresponding to a piece of reference):

```
@article{he04,
    author="Ligang He",
    title="The {P}rediction {F}ramework ({PF})",
    year="2004",
    journal="ITPDS",
    volume="1",
    number="3",
    pages="1-10“
}
```

Notes: The common types include article (for journal publications), inproceedings (for conference publications), and book.

Get your Latex document to use the Bibtex file.

- Right before \end{document} in your latex source file, add the following commands

```
\bibliographystyle{plain.bst}
\bibliography{bib file}
```

- Use \cite{ref_key} to cite the reference in the main text

Tables

- \begin{tabular}{arguments}
- \end{tabular}
- *l*: left-justified column
- c: centered column
- r: right-justified column

```
\begin{tabular}{ l c r }
   1 & 2 & 3 \\
   4 & 5 & 6 \\
   7 & 8 & 9 \\
\end{tabular}
```

1	2	3
4	5	6
7	8	9

- Expanding upon that by including some vertical lines:

```
\begin{tabular}{ l | c || r | }
   1 & 2 & 3 \\
   4 & 5 & 6 \\
   7 & 8 & 9 \\
\end{tabular}
```

1	2	3	
4	5	6	
7	8	9	

- To add horizontal lines to the very top and bottom edges of the table:

```
\begin{tabular}{ l | c || r | }
   \hline
   1 & 2 & 3 \\
   4 & 5 & 6 \\
   7 & 8 & 9 \\
   \hline
\end{tabular}
```

1	2	3
4	5	6
7	8	9

- to add lines between all rows

```
\begin{tabular}{ l | c || r | }
    \hline
    1 & 2 & 3 \\
    \hline
    4 & 5 & 6 \\
    \hline
    7 & 8 & 9 \\
    \hline
\end{tabular}
```

1	2	3
4	5	6
7	8	9

Figures

- to import any images into your document using Latex, the file format needs to be EPS
- Under linux
  - Using *convert*, a command-line program, for example:
    - convert graph.jpg graph.eps
  - Using *The GIMP*, a graphical software
    - Open a graph with one format and then save it as another format
- Under Windows
  - Print to a file, and then change the extension of the file to .eps
- \includegraphics[*arguments*]{*image_name*}

Thesis class

- \documentclass{thesis}
- \chapter{*chapter title*}
- \tableofcontents

Summary

- Structure of the Latex source file
- How to process the source file to get the pdf file
- Comands for generating title, author list, abstract, sections and subsections
- Mathematics
- Cross references
- Bibliography
- Tables
- Figures